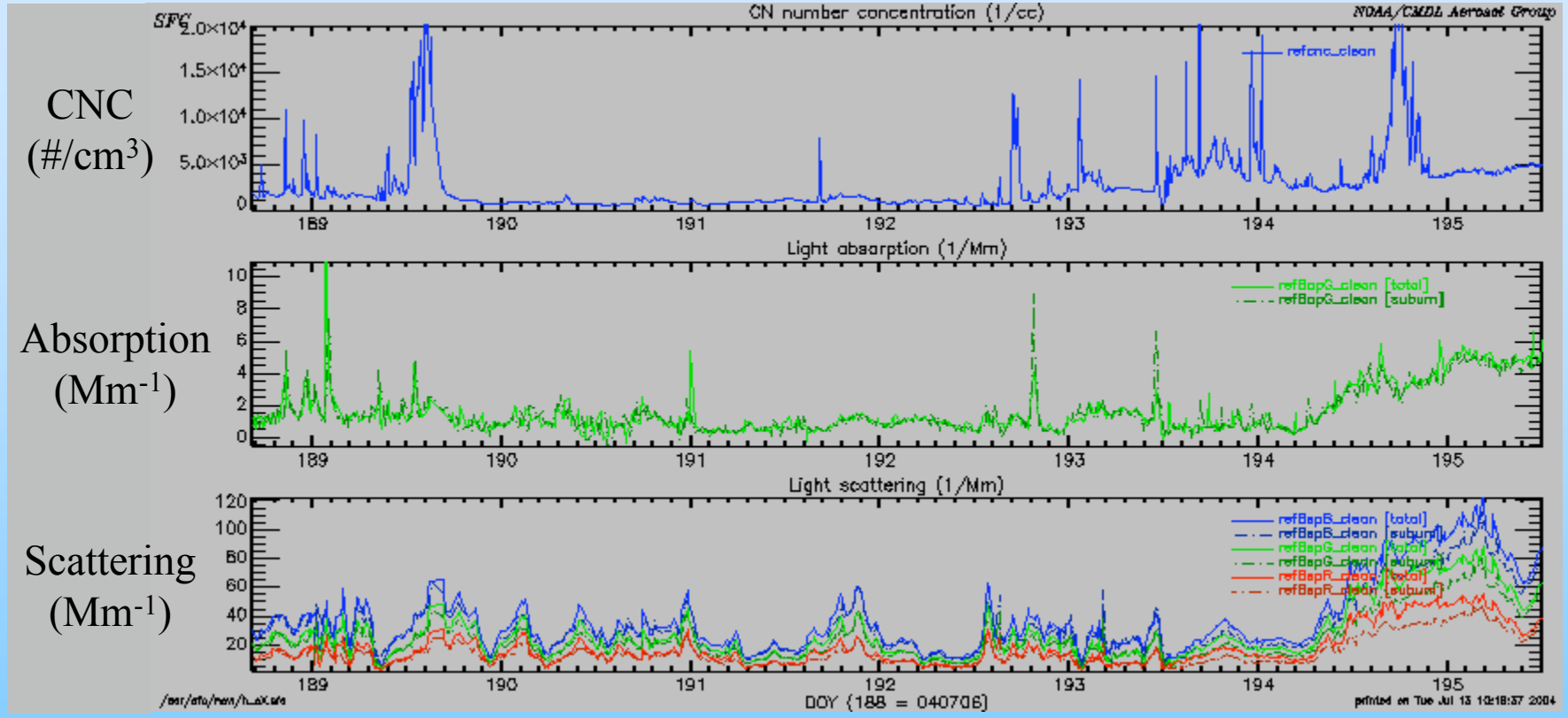
Extensive Aerosol Optical Properties
(condensation nuclei concentration, light scattering, light absorption)

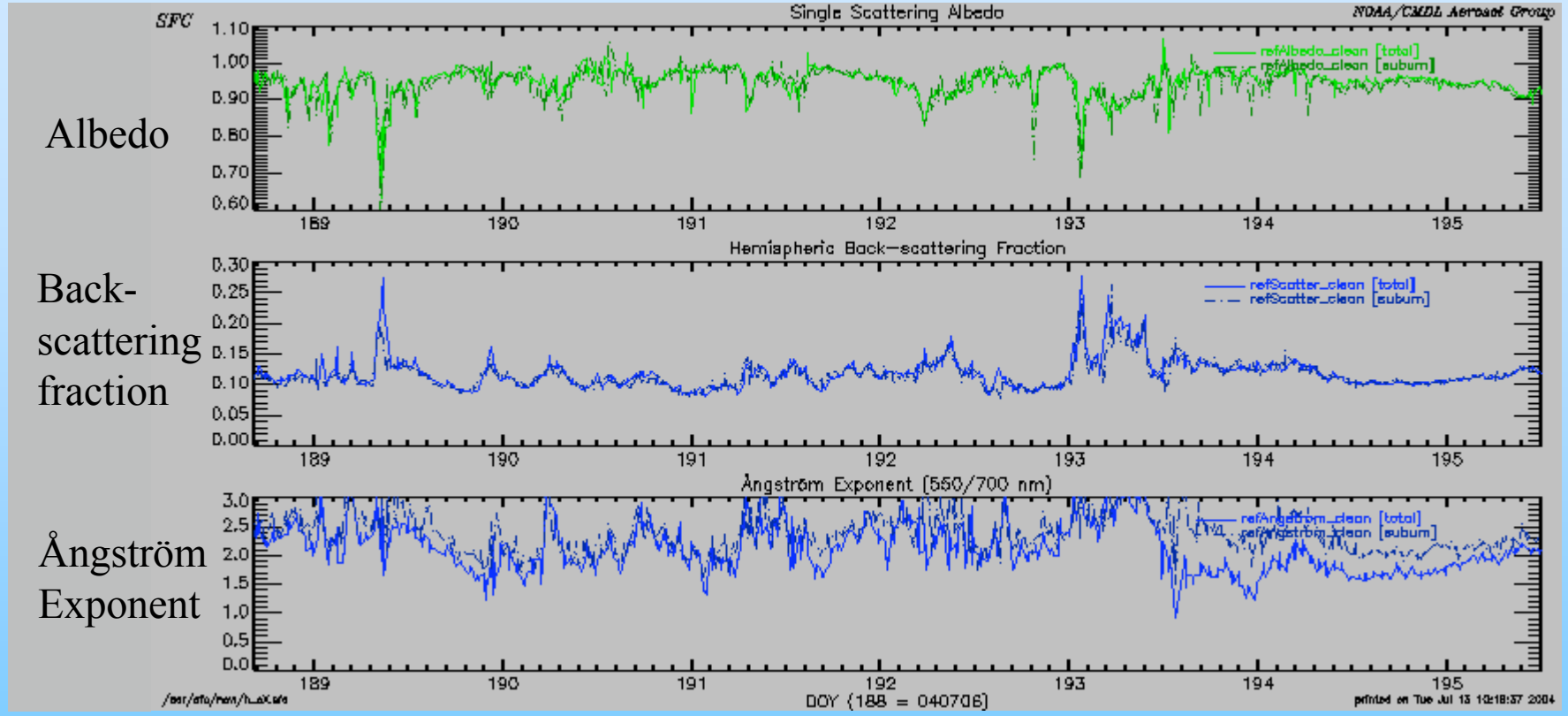


10^6 m^{-1} = 1 Mm^{-1}

6 minute smoothing, corrected to STP
standard instrument corrections (Bond et al 1999, Anderson and Ogren, 1998)

Extensive properties indicate the amount of aerosol present.

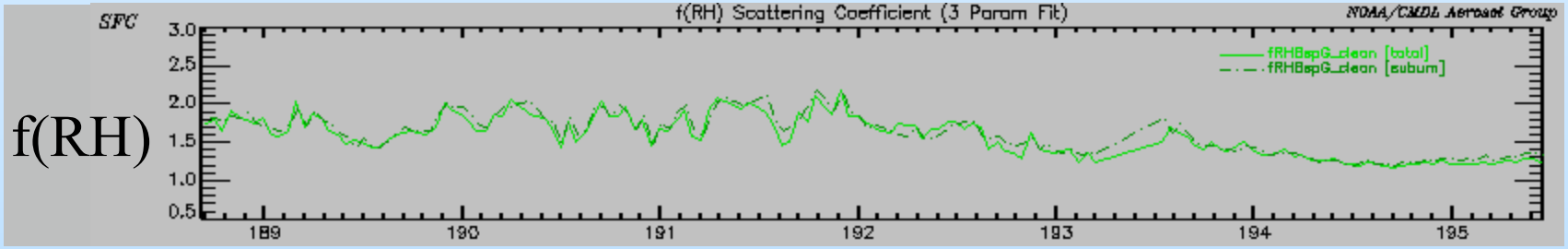
Intensive Aerosol Optical Properties
(single scattering albedo, backscattering fraction, Ångström exponent)



Intensive properties are unitless and indicate integral characteristics of the aerosol:

- Single scattering albedo - the ratio of scattering to extinction – suggests relative particle ‘darkness’
- Backscattering fraction – the ratio of back to total scattering – is related to the asymmetry factor
- Ångström exponent - the wavelength dependence of scattering - suggests particle size

Hygroscopic growth



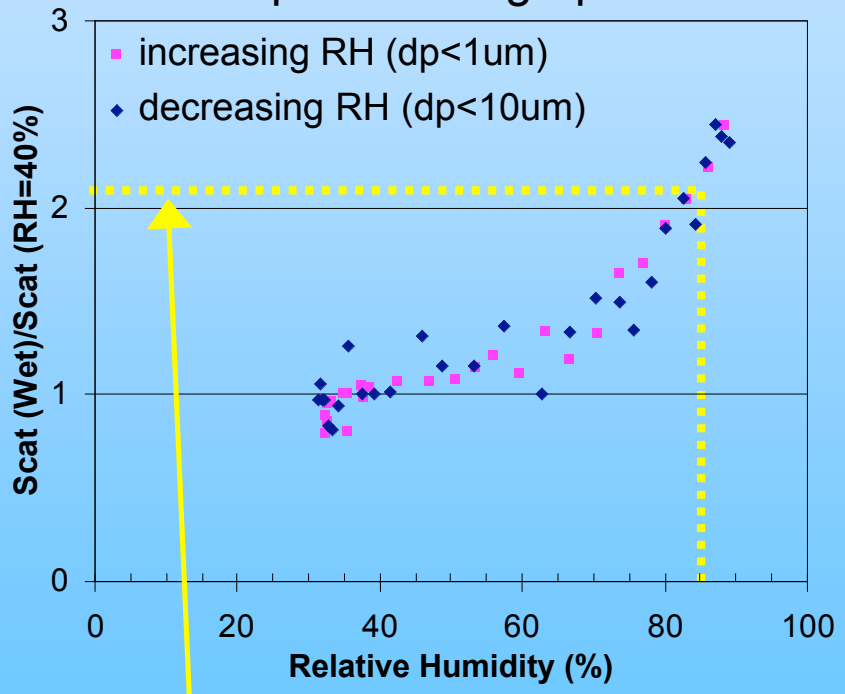
At Chebogue Point, f(RH) varied between 1.5 and 2.2.

Modeling studies of ammonium sulfate show a range of f(RH) depending on size distribution.

D_p (um), σ_g	f(RH)
0.3,1.5	2.79
0.6,1.5	1.75

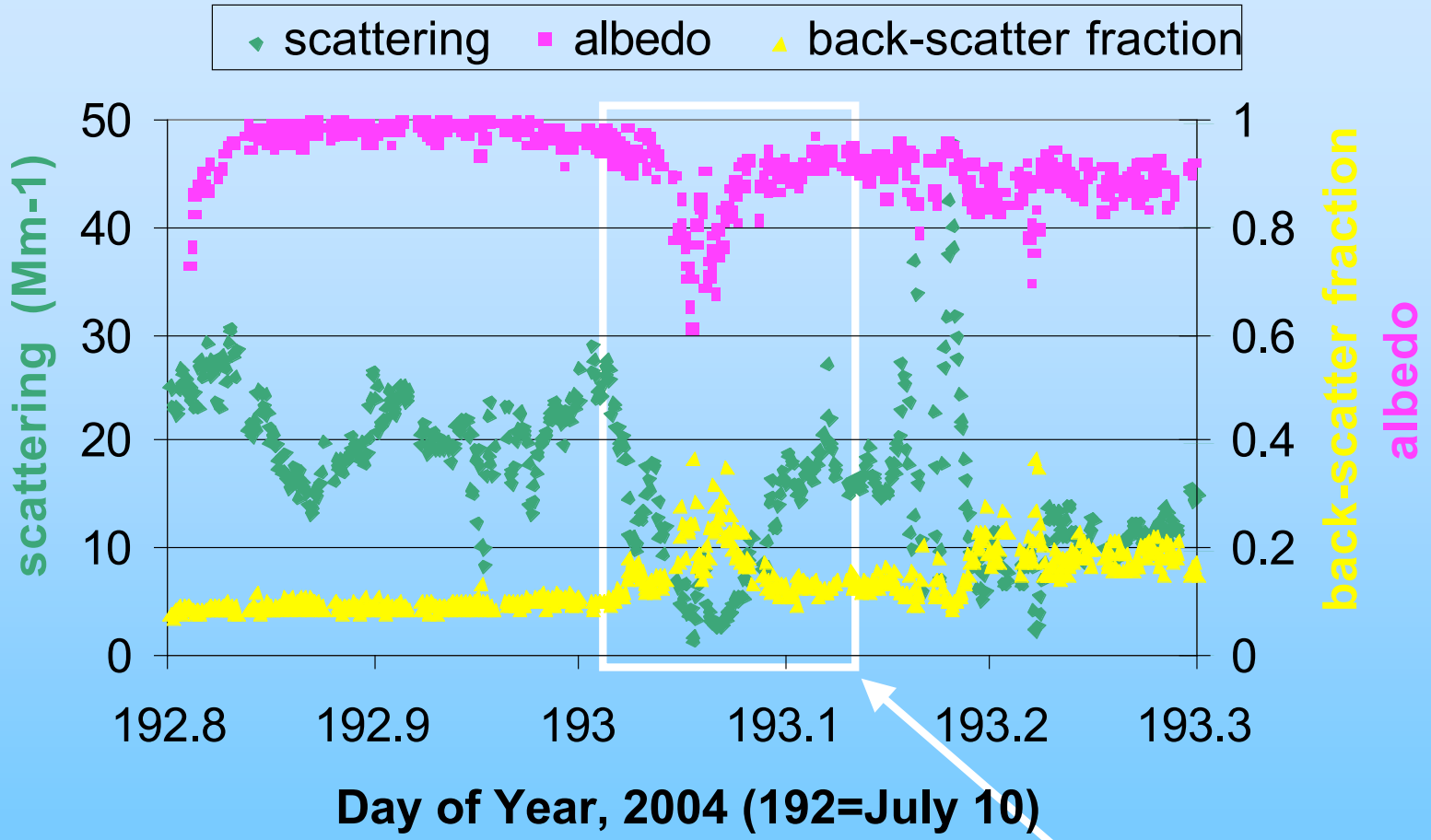
From Tang, 1996

Sample humidograph scan



f(RH)= Scattering (RH=85%) / Scattering (RH=40%)

Effect of fog on aerosol optical properties



Onset of fog causes:

- Decrease in light scattering,
- Increase in back-scatter fraction,
- Decrease in single scattering albedo

J. Ogren 7/14/04